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THE JOURNAL OF PHILOSOPHY

VOL. XXVI. NO. 23: NOVEMBER 7, 1929

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PUBLISHED FORTNIGHTLY
BY THE
JOURNAL OF PHILOSOPHY, INC.

THE JOURNAL OF PHILOSOPHY

All communications to the Editors should be addressed to Professor FREDERICK J. E. WOODBRIDGE, or Professor WENDELL T. BUSH, or Professor HERBERT W. SCHNEIDER, Columbia University, New York.

Subscriptions and advertisements should be sent to THE JOURNAL OF PHILOSOPHY, 515 West 116th Street, New York. The annual subscription price (twenty-six numbers) is $4.00 and the charge for single numbers is 20 cents. Advertising rates will be forwarded on application.

THE JOURNAL OF PHILOSOPHY is owned by The Journal of Philosophy, Inc., 515 West 116th Street, New York, and published at Lancaster, Pa.: President, Wendell T. Bush; Vice-President, Herbert W. Schneider; Treasurer, Frederick J. E. Woodbridge; Secretary, Iris W. Wilder.

Entered as second class matter, March 18, 1921, at the Post Office at Lancaster, Pa., under Act of Congress of March 3, 1879.

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VOL. XXVI, No. 23. NOVEMBER 7, 1929

THE JOURNAL OF PHILOSOPHY

THE PROBLEM OF NAMES, AS ILLUSTRATED BY THE WORD "LIGHT"

THE extensive use of radiations beyond the violet end of the spectrum in hygiene and other practical concerns may serve as a text for a brief psychobiological discussion of the use of words.

A patient being treated by this kind of therapy was asked whether the doctor speaks of "ultra-violet light" or "ultra-violet radiation." The reply was, "Ultra-violet radiation, of course, for it is not light." To common experience light is something that one sees, and by the aid of which he sees surrounding objects. To such experience nothing is light unless it is visible and contributes essentially to making external objects visible. But students in aspects of the problem of light other than those involving light as an agency in vision are wont to take no account of such experience. Recognized leaders in this field say it is a mere matter of choice whether one says "ultra-violet light" or "ultra-violet radiation." Such a statement ignores the fact that all language is developed primarily on the basis of, and as an instrument of, common experience.

Had our ancestors who gave us the term "light" known much more than they did know about the physical nature of the thing, they might have shaped their ideas and verbal practices to make the word cover the greater scope of radiations modern specialists would now make it cover. But they would then have given us some term which our language does not contain to designate their experiences via their eyes.

So intricately do the meanings of words get woven into the fabric of human culture that technical students are powerless to change them completely. The combination "invisible light" (now frequently seen and heard) can be justified only on grounds that would justify the combination "spherical cube." If such combinations as "invisible light" and "sperical cube" are made it is done in defiance of the certainty that the words "light" and "cube" have a mental (subjective) as well as a physical (objective) component in their meaning. Both of these components are inherent in the total situation, the one in the nature of the external world, the other in the nature of the mind.

In a recent brief publication,[1] one of us expressed the view that an adequate theory of relativity will have to include quality-quantity

[1] "Is Life Quantity?" *Science*, April 19, 1929, pp. 425–427.

as a "continuum" in the essential sense that the Einsteinian theory contains space-time as a "continuum" (by "continuum" we mean inseparableness both as to objective and as to conceptual reality). The term "light" may be utilized to illustrate the extension of the principle of relativity (of essential relatedness) to quantity-quality. The qualitative moiety of the continuum furnishes the sense-data, or in other words the observational data of all natural knowledge. From this it follows that since the reality for which the word "light" is a name has this double nature the attempt to investigate either part of the duality, that is, either physically or psychically, as though the other part were non-existent or even irrelevant, is bound to run into unconquerable difficulties.

In human experience the word "light" has been inseparably linked with eyes, not only with eyes of humans themselves, but also with eyes of other creatures. In the course of millenniums of curiosity and inquiry about themselves and their eye-bearing animal neighbors, men made two discoveries about eyes and their rôle in seeing: (1) There are many kinds of creatures possessing many kinds of eyes, grading down to such smallness and simplicity as to make them almost unrecognizable as eyes. There are also many creatures which, though unmistakably animals, some of them very lively ones, have no eyes whatever, and hence, inferentially, no sense of sight. They could have no term corresponding to "light," had they a language of words. Useful to man as are his eyes as organs of response to light, such organs and such a function are not fundamentally essential to his life. The experience of the totally blind is confirmation of this. To be alive is a far more basic fact of animate nature than is ability to see. Seeing is a secondary phenomenon somehow derived in the course of evolution from more basic forms of organic response.

(2) But man's curiosity about this whole matter did not stop there. He was goaded by the desire to know how the action of his eyes in seeing is connected with his thinking and other mental activities. The discovery was made, more definitely by George Berkeley than by anybody before him, that the part in seeing played by our eyes contributes only raw materials to our perception of external bodies. When eyes have responded to the radiations called light their part in the whole act of seeing is done. For the information we get about the shapes, sizes, distances, and directions of bodies, and for the perception of space itself, we are dependent on factors additional to the thousands of nerve-terminal responses to radiations falling on our retinæ. Exactly what additional factors are involved is still in some doubt. The expanded character of the retinæ, and the fact that there are two of them located some distance

apart, are known to be important factors. Of other sensory factors perhaps those connected with certain muscles are most generally recognized. "There is no conceivable way in which the perception of space could be built up except through muscular activity and the resulting kinesthesis."[2] This applies to visual as well as to all other forms of spatial perception, and has the support of much psychological research. Of the sensory rôle of the muscles of the eye, those for adjusting the lens and those of the eyeball is perhaps the most subtle. But many other muscles, notably those of the eyelids and those for moving the head, are involved. Nor is there the least doubt that the tactile sense plays a great part in interpreting many objects that we see. Whether surfaces are flat or curved, hard or soft, cold or hot, are queries in which our eyes fail us: we resort to touch or some other sense for the answers sought. Incalculably great as is our debt to our eyes for our knowledge and our ability to use it, nevertheless eyes, acting independently of all our other sensory equipment, would be impotent as contributors to knowledge. Life is far more basic and original than is any one of its many forms of sensation, the sense of sight not excepted.

Concomitantly with studies on the psychobiological aspect of light, researches have been successfully pursued on the physical aspect of the radiations themselves. Vast observational and theoretical investigations have acquainted us with the existence of forms of the radiations to which eyes do not respond—with their speed and their mode of propagation. We have also been given such pregnant theories connected with the radiations as those of the luminiferous ether, or the "ether of space," and the undulatory and corpuscular theories. But these magnificent discoveries and hypotheses about the radiations do not influence the fact of the stimulatory effect of some radiations on our eyes or their contribution to our knowledge-getting and knowledge-using. Men of all races and cultural grades, and presumably all other eye-possessing organisms, have been the beneficiaries of this particular form of the radiations although ignorant of modern discoveries and theories about their nature. The physicist may be beset with doubt as to whether the wave or the corpuscular theory or some combination of the two theories is true. But he does not doubt that through the intermediation of his eyes, light is an indispensable contributor to his knowledge. His reliance on "actual observation" and "experimental verification" testifies amply to his faith in his eyes and hands.

Scientific discoveries about light have expanded and enriched man's intellectual life beyond calculation. These discoveries he has

[2] Knight Dunlap, *The Elements of Scientific Psychology*, p. 260.

achieved by skillful utilization of his general attribute of sensory responsiveness to the external world. Through it all the attribute itself has remained just what it was at the outset—a fundamental prerequisite of life itself and hence a common attribute of every object that is really alive. Hence the importance for our knowing and living that we gain as much insight as possible into the nature of responsiveness in general.[3] Ask yourself, "What is the least that I must do in order that I may continue to live?" Answer: "I must breathe, I must drink, I must eat." Further: "My breathing must consist in inhaling and exhaling air: my drinking must be an affair of imbibing water in one form or another; my eating must consist in getting food of some sort into my digestive system in some way." So far you are able to go with your answer without anybody's help. But each of the three sets of indispensable actions you mentioned involves a whole retinue of sensory responses which can be adequately known only through scientific research. Basic among these are the sensation of touch, and kinesthesis, or the sensation of muscular action. The respiratory center in the medulla and other deeply located structures of contactual response are essential to maintain the round of nutritial activities in balanced and harmonious function.

Whatever we *do* and whatever we *are,* we do and are as living organisms. We are such by virtue of the activities just mentioned. It is futile to attempt to understand or deal effectively with any of our particular activities, for instance, using our eyes in seeing and our brain in thinking, as if these were independent of our sensory attributes involved in those activities. Few paradoxes of human habits are more puzzling to the naturalist than is the amount of study mankind may bestow on himself, while neglecting the fact that individuals must be alive in order that there may be either students themselves or men to study. The problem of vision, like all problems concerning ourselves, is inseparable from our nature as living organisms.

Of the volumes written on vision during the last two centuries, none is more monumental than Helmholtz's *Handbuch der physiologischen Optik.* Even to read and understand all of this would be a task of years. Nevertheless, a consultant of it, though only a tyro in the subject, is given no chance to doubt what the author's attitude and general conclusions are. His attitude is that of the observer and experimenter; he takes the "Empirical Theory" of vision as his guide. One consequence of this is the recognition he

[3] A partial account, but one which has contributed to the background of this essay, may be found in "The Organismal Conception, its Place in Science and its Bearing on Philosophy," by Wm. E. Ritter and Edna W. Bailey, *Univ. of Calif Publs. in Zool.,* Vol. 31, No. 14, pp. 307–358, 1928.

gives to the dependence of sight on other senses, preëminent among these being touch, the "muscular feeling," and the "feeling of innervation." Although Helmholtz was impressed by the "harmony between the senses of sight and touch," he failed to penetrate to the deeper levels of its significance. He followed the universal custom of taking as an unexamined datum the fact that he himself must be alive in order that he might have and use his eyes at all. He stands with those moderns who are not yet modern enough to have noticed that the Socratic pronouncement, "An unexamined life is a life not worth living" must now be revised so as to refer to the life of the body no less than to that of the soul, the ancient Greek having referred to the soul alone.

We indicate our ground for this view. In William James's criticism of Helmholtz's theory of the perception of space, we read: "Finally, in a single momentous sentence, he [Helmholtz] speaks of the sensations of touch as if they might be the original material of our space-percepts—which thus, from the optical point of view, 'may be assumed as given.'"[4] Although we have searched the copies and editions of the *Handbook* accessible to us for the passage to which James refers, we have not found it for a certainty. We do not doubt the correctness of the statement, however, partly because of James's general reliability, partly because it seems to accord well with Helmholtz's general position. So far as we can judge, James is correct when he writes: "He [Helmholtz] beautifully traces the immense part which reproductive processes play in our vision of space, and never—except in that one pitiful little sentence about touch—does he tell us just what it is they reproduce. He limits himself to denying that they produce originals of a visual sort" (*ibid.*, p. 280). Helmholtz missed the mark in his "pitiful little sentence about touch" in that he did not take sufficiently into the reckoning the fact that visual "reproductive processes" could not have been the original contributors to men's perception of space for the reason that the foundation for space perception was laid eons before vision came into existence, this foundation being coexistent with any living organism whatever, and wholly dependent on the sort of contact with externality which gives the sense of touch. Common experience knows "touch" to be a *sine qua non* to our being alive and able to perceive space visually or in any other way, or to do anything else. "The son of man came eating and drinking"—and breathing. To ignore this crass fact while trying to conceive the nature of man and of the world is to try to conceive that nature with nobody to do the conceiving. Exact knowledge is as much a matter of using names with exactness as

[4] William James, *The Principles of Psychology*, Vol. II, p. 279.

it is of using enumeration, measurement, and symbols of quantity with exactness. It is fundamentally important to notice that quantity is never wholly lacking in any of the sciences of animate nature, nor is quality ever wholly lacking in any of the sciences of inanimate nature. We glimpse here the psychological justification of the historic fact that nomenclature has, since Linnaeus, been so fundamental a methodological matter in systematic botany and zoology. The tremendous efforts made by cultivators of these branches of natural science since the introduction of the binomial method of naming species, to give names that shall always apply to a particular group of organisms and to nothing else, has not, we are quite sure, been sufficiently appreciated in its general bearing either by naturalists themselves or by others. The importance of this nomenclatorial innovation for bringing order and precision into these sciences is immeasurable, despite the fact that the complexity of the phenomena is so overwhelming as to have made it impossible for even a world-wide association of experts to overcome all the difficulties.

Perhaps the most successful effort thus far made in any field of natural knowledge to give one name and only one to a particular kind of object, and to make it apply to nothing else than this kind, is the BNA system in anatomy. The letters stand for the "Basle Anatomical Nomenclature." Above 5,000 names are included in the system and its adoption is said to have unburdened the study of the macroscopic structure of the human body of some 45,000 unnecessary synonyms.

What this implies toward facilitating the learning of man's physical make-up and toward exactness in dealing with it is not easily appreciated by anybody who has had no practical experience in this field. This BNA system illustrates very well the idea emphasized by George Sarton and other scientists that the progress of science has depended to a large extent on gaining freedom from the shackles of verbalism. For even in technical cases like this the shackles do not consist entirely of a maze of synonyms. They consist partly of more or less mental obscurity as to the exact nature of the object for which the name is a label and the word (or phrase) as itself a kind of reality.

It is a queer commentary on the workings of the human mind that a man [5] whose fundamental training was in mathematics and the application of mathematics to natural phenomena should have been one of the first, if not the very first, modern to see the broader,

[5] William Whewell, *History of Scientific Ideas*, p. 121 (Ed. 2; London, John W. Parker & Son, 1847), and *Novum Organum renovatum* (John W. Parker & Son, 1858).

more philosophic bearings of naming, describing, and classifying for natural science.

The vocabulary of primitive man appertains almost entirely (the exceptions though numerically few are exceedingly important) to sense data. That is to say, it appertains to the qualitative side of the quality-quantity continuum. To this vocabulary highly cultivated man has added another for the quantitative side. This is the language of mathematics—an elaborate set of signs and symbols which are free of "qualities" except for the sense data derived from the characters themselves. The conclusion seems unescapable that the phrase "observable quantities," used in mathematical physics, is meaningless unless understood to be an abbreviation for some such phrase as the measured aspect of the observable, or sensory data.

This we take to be essentially the same as the conclusion expressed by Dewey:[6] "Without immediate qualities those relations with which science deals, would have no footing in existence and thought would have nothing beyond itself to chew upon or dig into. Without a basis of qualitative events, the characteristic subject-matter of knowledge would be algebraic ghosts, relations that do not relate."

These considerations suggest that in the future Science will not be divided into "exact" science, and "natural" or "descriptive" science: but all science will be "exact," and all science will be "natural" and "descriptive," the exactness having reference always to two things, quantitative determination, and the qualitative reference of words. But the demand of nomenclatorial exactness holds only for science, not for general literature—at least in the same sense.

Indeed poetry which seems to represent an inevitable effect on man's lingual expression of the development to an advanced freedom of his imaginative power, is a commendable break with this demand. For imagination thus developed naturally inclines to exercise its freedom in just those realms of experiential reality which mean most to humankind. Hence the enrichment of language by the figurative use of names of real things which are specially important to us as living organisms. This very name "light" illustrates the point endlessly: "The light that never was on land or sea" (Wordsworth); "Lead, kindly light" (Newman); "The light of Asia" (E. Arnold). Such figurative or metaphoric uses of the name are admirably justified since they are wonderfully expressive and do no violence to the fact that light in its exact meaning is one of the greatest of all man's sensory aids to knowledge and understanding and life itself.

Our knowledge-getting and our knowledge-using are neither more nor less than activities among our other activities. The gen-

[6] John Dewey, *Experience and Nature*, p. 86.

eration to which we belong is, because of advances in knowledge, faced as no previous generation has been faced, with the problem of understanding these unique activities of ours. It seems as though real advance in knowledge of man and of nature can not go much further in the absence of an analytical knowledge of the processes and constructions essential to knowledge itself.

There are signs of a tendency to "reduce" the concept of existence to the concept of particles so minute that only professionals equipped with complex and costly instruments can observe them; and to transform all knowledge to a metaphysic [7] so intricate that only the most gifted and highly trained can understand it. The author of the significant book just referred to, a philosopher by vocation, seems to believe it necessary to conclude from the present situation in science that since there is no real science except the quantitatively exact (suppositionally exact) physical science, whatever knowledge we mortals may get of our own selves which is not physical must be metaphysical. The tendency is unmistakable with a class of writers, technical and popular, to "take it for granted" that what was formerly called natural science, which depended largely on qualitative description, was not science at all, and must no longer be so recognized. We have not seen a more learned and sustained manifestation of this tendency than is contained in this book. Such a trend of things surprises those of us who have devoted years of work to the descriptive and classificatory sciences in the belief that they are of fundamental importance.

Moritz Schlick is another professional philosopher who writes and speaks confidently to the same general effect; and from him and other sources we gather that metaphysics, revised largely on the basis of physics, now has a strong and crescent place in German philosophy.

Or as an alternative for the metaphysical road there is wide open the road of mystical doctrines of the most varied sort, all of which are dangerously antagonistic to careful, patient observation and thought.

In the absence of an interpretation of man that shall include the whole of him, *his knowledge-getting and using with the rest,* we are given an interpretation of the world that contradicts all man's previous experience of it. This experience has included his knowing the world, his living and thriving in it, and his cherished belief that a large part at least of it is good.

It would be the climax of irony were all mankind obliged to accept, as the outcome of efforts in two of the oldest domains of

[7] See, for example, *The Metaphysical Foundations of Modern Physical Science,* by E. A. Burtt.

man's knowledge, physics and philosophy, the conclusion that man's experiences are less substantial than the stuff of which dreams are made. But fortunately *such a conclusion would be made of the very same stuff.*

The grievous predicament into which even science may drift by failing to give enough attention to the meaning of words gets ample illustration in connection with this very word "light." That color is inseparable from light is never questioned. But color is so obviously "subjective" in part that the conception of it as "mere appearance" is rather common among scientists as one of the "secondary" qualities of the older psychology. Among the "accidents" of the sense world color is somewhat specially accidental. Hence the stigma of illusion which modern physicists think must be placed upon all sense-acquired knowledge falls specially heavily on color. Even so distinguished a physical scientist as Eddington [8] does not avoid some of the pitfalls here. The beautifully striking comparison between water waves as viewed by a hydrodynamist and a poet must have attracted the attention and (we hope) the sympathy of all readers of the book referred to. To the poet the waves were "dancing in the sunshine." But, we are told, a "rather clumsy trick" was played on him. "Aethereal vibrations of various wave lengths, reflected at different angles" were the really real realities in the case. So what the poet saw "of course was an illusion" (p. 317).

The glinting light (mostly *white* light) was an illusion to the poet. Yet to the physicist light manifested in the colors of the spectroscope is one of the most fertile, most trusted, most highly-prized of all his knowledge-getting methods! Such a situation may not be greatly disturbing to exact science, but to common sense it is unendurable.

Epistemology, or Theory of Knowledge, has for centuries been a foremost concern of philosophy of the schools. We have reached a point in the scientific study of man and of living beings generally at which it becomes imperative to have not merely a theory of knowledge, but a *science* of knowledge. Our activities in knowledge-getting are as open to analytical study as our activities in breathing, in digesting, and in reproducing. Our knowledge of human reproduction has been gained by beginning with that phenomenon as common experience finds it, and "running it down" into details, advantage being taken of morphological, physiological, comparative, and all other available methods. That knowledge did not begin with the knowledge of "ultimate" or infinitesimal and obscure elements of reproduction, and from there proceed to build up the knowledge of common experience. Likewise for the study of knowledge and knowledge-getting, we must begin with the phenomena

[8] *The Nature of the Physical World,* by A. S. Eddington.

which common experience contains. The sensory perception of objects in the world around us is universal in human experience. This brief essay outlines an analytic study of sense perception in one field; that in which eyes are the sense organs, and those radiations from certain bodies to which eyes respond (hence called light) are the stimulatory agents in the external world.

Much of what is written on these pages would strike many persons as strange, if not meaningless. But we do not believe a feeling of strangeness can attach to any of the crucial words if these be taken just one by one. Eye, muscle, lens, retina, seeing, touching, feeling, thinking, knowing; respiration, digestion, reproduction; breathing, drinking, eating; human organism, individual, living being—there is nothing strange or doubtful of meaning in these and many other words scattered through the text, if they are taken as in ordinary life we do take them. But many a "thinker" could not without serious effort take them thus. By the mental habits of all his scholastic life the words would be hampered by "entangling alliances."

Almost the whole force of modern culture as reflected in education—much of education in science by no means excepted—tends to shunt knowledge out of the main channel in which it would normally continue. This idea has elsewhere[9] been expressed in the statement that man's knowledge is in its early stages naïvely naturalistic, and would become critically naturalistic as the individual develops toward maturity, but for diverting influences. Had human knowledge been historically able to run its normal course, and were it able to run this course in individual development, there never would have arisen and there never would arise that harassing theory that man's Body is one thing and his Mind, or Soul, or Spirit is a wholly different and independent even though "parallel" thing.

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SOME ATTITUDES AND CONSIDERATIONS AND A BIOLOGICAL ARGUMENT FOR EPIPHENOMENALISM

THE considerations to which my attitudes lead me probably contain no more truth than many other considerations. The attitudes involved, however, are more likely to lead to an enrichment of truth through the criteria of crucial experiments than the usual attitude which considers the implications of only one certain sys-

[9] *The Natural History of our Conduct*, by Wm. E. Ritter with the collaboration of Edna W. Bailey, p. 7 and p. 136.

tem. My considerations are "limited" to naturalism—one must set a limit somewhere—and I have found naturalism far from limiting. The material I shall use is familiar to every one, but I believe the attempt is seldom made to present impartially the crucial implications of conflicting views.

I

I can make no objections to Mr. Sellars' system of critical realism, but having a weakness for exact statement I find some fault with his presentation of his system in places. For example, though he always emphasizes the being of the subject self *in* nature, he usually, at least by implication, leaves subjective factors—i.e., factors *in* the self such as logical identity, relations, percepts, and universals—outside of nature. *"In"* expresses a transitive relation. Again, I agree with him that, though a certain branch of mathematical physics may be interested in only external relations of highly abstract entities, most science—viz., the rest of physics, chemistry, biology, and psychology—is interested in dynamic systems, systems related internally; but I can not for that reason deny, as he seems to in places, the existence of innumerable external relations in nature, and in nature independently of thought or perception. If, as Russell and Whitehead suggest, every electron is in dynamical relation with every other electron, nevertheless, every electron is in a number of external relations to every other electron, and various dynamic systems are in numerous external relations to various other dynamic systems.

The only other fault I find with Mr. Sellars' presentation is the fault present in most philosophical arguments; viz., the failure to consider at least tentatively incompatible systems. Mr. Broad furnishes a delightful exception, and (what one is inclined to believe to be due to a concomitant characteristic) indicates a possible empirical method of deciding on a realistic epistemological view simply by determining the independent physical causes of perception.[1] Most philosophers as a rule seem not to realize that the epistemological question may some day be settled by crucial experiments. If they realized this, they would assume a more tentative attitude toward their own epistemological prejudices.

However, because of my naturalistic tendencies my own epistemological prejudices are, I fear, rather narrow. Besides Mr. Sellars' dualistic epistemology, I entertain a naïve view of perception on the order of Professor McGilvary's. But I can not, merely to make all knowledge intuitional, follow the new realists in hypostatizing an eternal realm of essences or subsistent entities the various members of which, according to Mr. Holt at least, seem to

[1] *Scientific Thought*, Ch. XIII.

jump about to meet their subject knowers. And no more appetizing or empirical are Mr. Montague's [2] memory and forecasting energies which jump out into the now non-existent past or the as yet non-existent future to come in contact with their objects. Knowledge may not be *either* intuitional (new realism) *or* symbolic (pragmatism): it may be, as James showed, a little of each. Furthermore, I do not see how, from a hodgepodge [3] of relatively concrete universals externally related, can be "deduced" dynamic systems internally related. Mr. Holt's view presupposes, besides his mysterious realm of universals, that all sciences are reducible to physics or at least to the elements of physics *plus* other elements. Now the *gestalt* psychologists have shown that organization is not necessarily a function of elements. Dr. Köhler says [4]: "The starting point [of the *gestalt* problem] was the observation that sensory fields are replete with qualities and properties which one neglects if one takes 'sensations' as their sole content and which, indeed, may have a mysterious aspect when first viewed in this way." (I am anxiously waiting for biologists to shift a little of their interest from genes to configurations.) Thus it seems to me that any theory of analysis which limits itself to an analysis into elements is too narrow to meet empirical demands. Such a theory confuses logical analysis with ontological analysis.

The only arguments I know of for a realm of essence, other than Mr. Montague's fatuous claim [5] that it reconciles all epistemological differences, are (1) that it permits knowledge to be intuitional and (2) that it is necessary for logical identity and thought. Mr. Sellars [6] has disposed of the first need as has Professor McGilvary.[7] They show that factors *in* our experience, *mean, point to,* or *symbolize* factors *outside* of our experience. These objects of ideas which may or may not have been *in* our experience *were* existing, *are* existing, *shall be* existing, or *never* exist.[8] The fact that so many first-rate thinkers do not experience the second need, that eternal essences are necessary for thought, makes the young naturalist hesitant about making such a sweeping assumption. I can not see why indistinguishable similarities are not as sufficient for thought as are logical identities or why the latter can not be reduced to the former (ontologically) just as well as the former to the latter (logically). It is

[2] *The Ways of Knowing,* p. 361 ff.

[3] *Concept of Consciousness,* Ch. VIII.

[4] *Gestalt Psychology,* p. 187.

[5] *The Ways of Knowing,* p. 319.

[6] *Critical Realism,* and other books.

[7] "The 'Fringe' of William James's Psychology the Basis of Logic," *Philosophical Review,* Vol. 20, p. 137 ff. (1911).

[8] E. B. McGilvary: "Time and the Experience of Time," *Philosophical Review,* Vol. 23, p. 121 ff. (1914).

prejudice to assume *a priori* that the order of being must correspond to logical order. Logical identity is logically prior to indistinguishable similarity because the former is logically simpler than the latter. Ontologically, however, logical identity is much more complex than indistinguishable similarity because the former demands its eternal realm when given ontological priority. And I prefer ontological simplicity where it is sufficient to meet the empirical demands to the presumption that the order of being corresponds to, or is, logical order. I do not know any more reasons for assuming that the universe corresponds to logical order than for assuming that it corresponds to a Hegelian Dialectic order. The development of Mr. Russell's hint [9] that logical and mathematical proofs are tautologies (nevertheless valuable and indispensable to empirical investigation) rather than ontological "activities," such as Mr. Holt believes them to be, might simplify considerably an ontology which, without the eternal realm, is complex enough to satisfy the serious-minded metaphysician.

However, as I have hinted, I have no more patience with Mr. Sellars' rejection of a naïve view of perception than I have with Mr. Holt's [10] disparaging rejection of epistemological dualism. Mr. Holt,[11] Mr. Broad,[12] and many others have disposed of the Berkeley thesis that variability proves subjectivity. The only argument I know of for rejecting the view that the contents of perception have existence independently of being perceived and when perceived are external in space to the perceiving organism (hereafter called the naïve view) is the fact that psychology has been unable to work under such an assumption. Mr. H. B. English is one of the few psychologists who consider the naïve approach. He says [13]: "Sensa can not be identified with parts or aspects of physical things, we are told, because of the non-veridical nature of some perceptions. Strictly speaking that is the case. Only we ought to begin our analysis with the perception, illusory or not, rather than with the reflectively abstracted sensa. And then the true statement seems to be, not that percepta are parts or aspects of the physical thing, but that the physical thing is part or aspect of the perceptum." Unfortunately his approach is apparently from an arm-chair only. However, as Mr. Broad has indicated,[14] the question may be settled empirically. The inability of psychology to work under the naïve

[9] *The Analysis of Matter*, p. 171.

[10] *Concept of Consciousness*, p. 121.

[11] *The New Realism.*

[12] *Perception Physics and Reality.*

[13] "Naive Psychological Realism vs. Critical Realism," this JOURNAL, Vol. XXIII, p. 683 (1926).

[14] *Scientific Thought*, Ch. XIII.

assumption may be due to the immature state of psychology as a science and possibly to the prejudice that it is "impossible" for the mind to be extended in physical space-time outside the physical organism. Mr. Russell says:[15] "We cannot, without a preposterous kind of discontinuity, suppose that the physiologist's percept, which comes at the end of this [causal] series, is anywhere else but in the physiologist's head." Such a discontinuity, however, is "preposterous" only in the framework of Mr. Russell's physics. But psychology and physics are not identical sciences. Furthermore, Mr. Bridgman has shown[16] that causal discontinuity is far from preposterous even in physics. Mr. Russell's statement presupposes, too, a narrow theory of continuous causal series. Mr. Broad has clearly shown[17] that *independent* causes may occur sometime before their results in time and separated from their results in space even though there be *dependent* or other *independent* causes intervening to form a continuous series.

II

Whenever Mr. Sellars considers epiphenomenalism in his *Evolutionary Naturalism,* he identifies it with the view that the organism is a mechanical automaton. His book is devoted to the attractive thesis that the organism is a dynamic system rather than a mechanical conglomeration of elements. Now perhaps in most presentations of epiphenomenalism the writer does consider the physical organism as a mechanical automaton, but may not the physical organism be a *dynamic* system of which consciousness is an epiphenomenal decoration? In such a case the human organism would not be an automaton governed by external forces, but a self-determining dynamic system which biology and psychology recognize it to be. The organism would, however, be just as efficient a system and would behave and function without consciousness the same as it does with epiphenomenal consciousness—providing, of course, that consciousness could be removed from it without much changing the dynamic physical organization, as is not the case except as it is approached in some instances of hypnosis.

Now the biological inclinations of a naturalist tend to cause him to distrust pure decorations, and this distrust is the only argument I know against epiphenomenalism. Of course, the fact that the only immediate knowledge we have of the stuff of the universe is the stuff revealed in consciousness—e.g., configurations, colors, sounds, tactile qualities, etc.—may indicate that there is no radical difference in substance between physical stuff and conscious stuff. Yet

[15] *Philosophy,* p. 140.
[16] *The Logic of Modern Physics.*
[17] *Scientific Thought,* p. 501 ff.

the fact that hardness is so different from the esthetic pleasure I experience when viewing a lovely sunset suggests, as we shall see in the next paragraph, that the argument between epiphenomenalism and interactionism is not fatuous. Epiphenomenalism must assume that physical stuff can behave under certain conditions of dynamic relatedness in complex enough ways to meet the demands of the biologist and psychologist. I know no reasons against such an assumption.

Now where we do have fairly precise knowledge of dynamic systems—viz., in chemistry and physics and of lower organisms where the biologist does not assume the efficacy of consciousness—we find that our explanatory concepts are of the nature of hardness and effort; e.g., such concepts as inertia, force, and energy. Configuration, intensity, and extension are about the only concepts we can apply somewhat in common to both our experience of dynamic systems and of esthetic reactions. In other words man's experience falls into two classes which may be called the "higher" and "lower" experiences, and from these "lower" experiences have grown most of the scientific concepts. For this reason configuration and intensity have been sadly neglected in the sciences until recently. The concepts which come out of our "lower" experiences have been refined and made precise by indirect and sophisticated methods, scientific method; but I do not believe science has abolished them. I am enough the naturalist to resent primitive anthropomorphism, but I resent also the superficial rejection of arguments on the ground that they are anthropomorphic. The enthusiastic naturalist often forgets that if man is a product of nature, nature must be "anthropomorphic" enough to account for man. The fear of anthropomorphism is largely responsible for the theoretical neglect, until recently, of dynamic systems in nature. I am of the opinion that force and energy are as *real* unexperienced as they are experienced. Most naturalists hesitate to discard the concept of extension from their explanations, yet surely that is an anthropomorphic concept. The criterion of the validity of an explanatory concept is not whether or not it is anthropomorphic, but whether it allows of prediction and control. Thus, since most of the scientific explanatory concepts have come from our "lower" experiences, it may be that our experiences reveal to us the nature of the stuff of dynamically behaving substance as being different from the stuff of the "higher" experiences.

It is because there are various satisfactory naturalistic solutions to the problems of epistemology and substance that I advocate a tentative consideration of various solutions until more empirical decisions can be made. The answer to the objection from biology that

epiphenomenal consciousness is purely decorative and therefore of no biological utility is this: The nature of nature may be such that certain complex dynamic relations can not occur without being accompanied by decorative features (non-causal features). It is impossible to give an example of such features from science because science is interested only in causal sequences and as a matter of fact has no means of discovering such features outside of experience fields. Within experience such non-active features are numerous *unless* we assume that they are epiphenomenal to some kind of phenomenon. Mirror images which we barely see as we pass in front of a window and immediately forget, fleeting colors, odors, and sounds which apparently leave us unaffected are a few of the numerous examples which could be given.

Mr. Sellars quotes [18] the following objection to epiphenomenalism made by Mr. Lovejoy: [19] "Never, surely, did a sillier or more self-stultifying idea enter the human mind, than the idea that thinking as such—that is to say, remembering, planning, reasoning, forecasting—is a vast irrelevancy, having no part in the causation of man's behavior or in the shaping of his fortunes—a mysterious redundancy in a cosmos which would follow the same course without it." Such an objection finds no application to an epiphenomenalism which does not belittle the activities of the physical organism, an epiphenomenalism which does not hesitate to admit that the laws of the physics and chemistry of the living organism are very different from the laws of the physics and chemistry of non-living matter or of dead organisms. Even the interactionist, if Mr. Sellars is a typical representative,[20] admits the difference between the chemistry of dead and living organisms. And epiphenomenalism need not deny the efficacy of thinking as such. It merely denies that thinking is efficacious if it is not a physiological as well as a (partially) conscious process. Professor McGilvary has shown [21] how the application of causal categories to concomitant psychic factors may be consistent with epiphenomenalism. In terms of a dynamic theory of the physical organism, meaning as conscious is the psychic decoration of certain dynamic physical wholes, and meaning as a causal factor in human experience is these certain dynamic physical wholes.

I believe there is one argument in favor of epiphenomenalism which satisfies our desire for biological utility. It is as easy to conceive of the attainment of survival value through the use of natural

[18] *Evolutionary Naturalism*, p. 312.

[19] This JOURNAL, Vol. XVII, No. 23, p. 632.

[20] *Evolutionary Naturalism*, p. 335. It seems to me that here Mr. Sellars almost argues for epiphenomenalism.

[21] "Huxley's Epiphenomenalism: A Criticism and an Appreciation," this JOURNAL, Vol. VII, No. 17, p. 449 ff. (1910).

processes which involve decorative concomitants as through the use of a unique dynamical substance. It is simpler to look for emergent properties (modes of behavior of physical stuff) from new organizations than from new substances. A new property may emerge from a total organization (a dynamic physical whole) without an emergent dynamic substance. If certain unique emergent properties prove always to be conscious, then those emergent properties may be called "conscious properties"; but the question of substance still remains; for if any naturalistic meaning at all can be found for "substance," I think it is applicable to some of the contents of consciousness; it remains for physics to decide if it is applicable to factors outside of consciousness, and for philosophy to decide how different or similar the meanings are. The universe may consist of dynamic processes and qualities, some of the latter being contents of consciousness *whenever* they exist (dual view) or (naïve view) *part* of the time they exist.

III

I do not see that the choice of a naïve or dual theory of perception has, at present, any bearing on the choice of interactionism or epiphenomenalism or *vice versa.*

If the naïve view of perception and interactionism furnishes the correct theory, then obviously there is such a thing as a discontinuous causal series in nature—preposterous or not. On the other hand since the naïve view supposes the stuff of the physical world to be hardnesses, colors, sounds, etc.—i.e., the stuff of sensa, though not sensations—the interaction would not be between substances of very different natures.

If the naïve view and epiphenomenalism furnish the correct theory, then there is not necessarily a discontinuous causal series, but there are discontinuous psychic phenomena.

If the dual view of perception and interactionism furnish the correct theory, then until we know more about the nature of physical substance we can not know how different the interacting substances are. The weakest point of this theory may seem to be the fact that our "lower" experiences have yielded the concepts of science. Thus they may very likely be closely analogous to the stuff of the physical world, and it is as simple to conceive of nature as making them identical as to conceive something of a Lockian copy theory. The critical realist will insist that percepts are not copies but are very different from the physical object, but he has no proof of this difference. Mr. Pitken shows that some biological phenomena such as the conductive reaction of the stimulus in the flatfish argue an "approximate identity between the stimulus and the conductive re-

action."[22] Such evidence is restricted to the functions of the "higher" senses, but I know of no evidence against the assumption of numerical identity in the "lower" senses between stimulus and experienced quality. However, if they are found to be numerically distinct, they may still be closely analogous. The naïve view may apply to some of our percepts and the dual view to others.

The same weakness and the same compensatory considerations apply to the theory of the dual view and epiphenomenalism. With this theory, however, there is no problem of the origin of a new dynamic substance.

We do not know enough about the universe as yet to say definitely whether survival values could be obtained more readily through (1) the development of a psychic substance in the brain to function in interaction with the physical brain to furnish a method of symbolizing external reality (dual interactionism), or (2) the development of self-determining processes in the nervous system, some of which involve concomitant psychic factors (dual epiphenomenalism), or (3) the development of physical processes in the nervous system which, in perception, acting in functional harmony with processes outside the organism (in the physical perceived object) involve a concomitant but non-efficacious intuition of the physical world outside the organism (and within), and, in ideational processes, involve psychic "fringes" to physical dynamic wholes (naïve epiphenomenalism), or (4) the development of interacting substances involving discontinuous causal series, one substance being related to the other at times in the relationship of awareness in perception, and in ideational processes one substance using itself or the other or both to symbolize factors not present to it (naïve interactionism). My appeal is simply that we do not try to prejudice psychological and biological investigation by refusing a tentative consideration to all the various naturalistic theories. Speculative knowledge should be a lead, not a block, to the attainment of tested knowledge. A desire on the part of philosophers to understand rather than to refute the implications of each theory might serve to reveal valuable fields for further scientific exploitation.

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[22] *The New Realism*, p. 397.

REPORT OF THE NINTH INTERNATIONAL CONGRESS OF PSYCHOLOGY

THE Ninth International Congress of Psychology was held at Yale University, September 1 to 7. The event is a notable one for many reasons. It was the fiftieth anniversary of the birth of scientific psychology, the fortieth anniversary of the beginning of

international cooperation in the form of the International Congress; it was the largest group of psychologists ever assembled, and it was the first time that the International Congress had met in America. The total attendance was 1,051. Of these 104 were foreign members. With the wives of foreign members and foreign guests included (and with members from Canada and Mexico counted in the American group) the number of foreigners is increased to 123. Twenty-one foreign countries were represented by from 1 to 22 psychologists. The largest number, 22, came from England. There were 17 from Germany, 10 from the Union of Socialistic Soviet Republics of Russia, 8 from the Netherlands, 6 from India, 5 each from Austria, France, Japan, and Switzerland, 4 each from Belgium and Poland, 3 from Italy, 2 from China, and 1 each from Australia, Brazil, Denmark, Egypt, New Zealand, Norway, Spain, and Sweden.

The relatively large number of representatives from the Soviet Republics is an interesting reflection of the activities in Russia. The highly centralized nature of their industries, business, and system of education makes psychological experimentation on a grand scale unusually feasible. The Russians are particularly active in the applications of psychology for this reason, and many psychological institutes are flourishing, such as the Psychological Institute of Moscow University, the Institute of Experimental Psychology, as well as institutes for neurology, pedagogy, and the like. In contrast with this relatively large representation from the Soviet Republics there was only one representative from the South American republics.

The Congress was organized around a system of formal meetings held in the mornings, a series of symposia held in the afternoons, and formal lectures in the evening by several eminent psychologists from various countries. There were relatively few formal papers presented in proportion to the total number of reports, namely 79 out of 457. They were distributed among 11 meetings devoted to Theory and History (2), Comparative, Educational, Methods and Technique, Social, Child Development, Physiological, Personality, Abnormal and Clinical, Experimental (2), Industry and Personnel. In the opinion of many foreign members there were far too many formal papers presented, with the tendency to scatter discussion over too wide a range at a given session. The titles of these morning meetings will give some indication of the preponderance of interests of the Congress. There was more concern with problems of theory, and experimental technique—what might be called pure psychology—than is evident at the annual meetings of the American Psychological Association.

Full scope was given for the expression of varied interests by

way of the 31 symposia conducted in the afternoons. Sessions were devoted to such general topics as Animal Psychology, Industrial Psychology, and Social Psychology, as well as to such highly specialized topics as the Galvanic Reflex, Eye Movements, Music, and Sleep. Papers not exceeding 8 minutes in length were presented at these symposia. As there were 370 such papers read at the 31 meetings, with an average of 12 papers per meeting (the number per meeting ranging from 4 in Social to 29 in Mental Tests), relatively little time was left for discussion. In fact, most of the symposia scarcely deserved the name, but took on the character of the morning sessions. With such a wealth of papers accepted for presentation, fruitful discussion was bound to suffer. One of the most interesting of the symposia was one devoted to the "Nature of G," with four papers. Here the topic was sufficiently specific to make the discussion pertinent and effective.

The evening lectures were given by Pavlov, Koehler, Michotte, Piéron, Stern, Ponzo, Spearman, and Thorndike. Pavlov spoke in Russian (translated by Aurep), Michotte, Piéron, and Ponzo in French, Stern in German, and the others in English. The address of the President of the American Psychological Association, Professor K. S. Lashley, University of Chicago, was delivered on Wednesday evening. In the "Basic Neural Mechanisms of Behavior" Professor Lashley gave a summary of the implications of his researches on the effects of cortical lesions upon learning and other mental functions.

The address of the President of the International Congress, James McKeen Cattell, was delivered at the opening session of the Congress on Monday morning. His subject, "Psychology in America," was particularly appropriate, as his active career spans the life of the science of Psychology in America. References to the early days when psychological laboratories were being born, and to the state of science generally at this period, furnished an illuminating background for the present congress. At the same meeting an address was delivered by Eduard Claparède, Secretary of the International Congress.

The arrangements for meetings and for entertainment were particularly fortunate. Foreign and American members alike were housed in the beautiful Harkness Quadrangle where the spacious lawns offered unusual opportunities for meeting and conversing with the foreign guests. Every afternoon tea was served in the University Dining Hall, and every evening a smoker was held in the same place. Both of these functions served admirably for individual contacts. Many plans for exchange of research information, for discussion of research projects by letter, for trans-

lation of books, and for their publication in English originated on these occasions. Perhaps more important still, permanent friendships were established among psychologists of all nationalities, which should be reflected in closer understanding and cooperation in the future.

A copy of *The Psychological Register* (published by Clark University), a directory of all living psychologists of the world, including a biography and a bibliography of the writings of each one, was presented to each foreign member and copies were available for other members. The circulation of the Register at this time was particularly fortunate, as it did much to facilitate acquaintance and promote understanding.

Before the congress the foreign guests were entertained by the psychological laboratories at Columbia and Princeton Universities, and after the congress at Clark and Harvard Universities. Many individual foreign members made more extended visits at various institutions, and gained a thorough insight into the construction and operation of our laboratories.

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BOOK REVIEWS

The Analysis of Matter. BERTRAND RUSSELL. New York: Harcourt, Brace and Company. 1927. Pp. viii + 408.

Philosophy. BERTRAND RUSSELL. New York: W. W. Norton and Company. 1927. Pp. vi + 307.

In *The Analysis of Matter* Mr. Russell discusses the philosophical significance of the contemporary reconstruction of the concepts of physics. The book is divided into three parts. In part I, "Logical Analysis of Physics," he gives a clear and concise account of some aspects of the quantum theory as it was developed during the period from 1900–1925. Unfortunately, before the book went to press a new and radical point of view had been introduced into quantum theory and the significance of the new methods had not been sufficiently determined for adequate philosophical comment. However, even though one takes the standpoint of the year 1925, there is cause for dissatisfaction with Mr. Russell's account. Like his *ABC of Atoms* the present exposition of quantum principles depends too much upon Sommerfeld's *Atombau.* Now the excellence of Sommerfeld's book consists primarily in the detailed application of the quantum theory to spectra. It is generally recognized, however, that Bohr's discussions of fundamental principles during the period from 1918–1925 were more general and profound. In my opinion

the most interesting epistemological characteristic of the quantum theory during this period was the systematic employment of Bohr's Correspondence Principle, according to which the quantum theory is to be fashioned so that it constitutes a rational generalization of classical theory. The creation of the new quantum mechanics by Heisenberg in 1925 may be characterized as the realization of the program expressed by this principle. And this aspect of the subject has been neglected in Mr. Russell's discussion, with the result that the transition to the new quantum mechanics is too abrupt.

The first part also contains an account of the theory of relativity. Students should especially welcome the chapter on the theory of tensors, which gives an introductory account of the mathematical technique of the theory of relativity.

The second part is entitled "Perception and Physics." Mr. Russell thinks that there are three possible views—solipsism, phenomenalism, and a causal theory of perception. In the *Problems of Philosophy* Mr. Russell adopted the causal theory of perception, according to which physical objects are inferred from percepts. In his Lowell Lectures (1914), which have been reissued this year under the title of *Our Knowledge of the External World*, he expounded a phenomenalism in which physical objects are constructed from perceptual data by the method of extensive abstraction. And now in the *Analysis of Matter* he returns to the causal theory. Physical objects are dissolved into events which are inferred as the causes of percepts. The intrinsic nature of events is unknowable, but some knowledge of structure can be inferred from the structure of percepts. The bifurcation criticized by Mr. Whitehead is avoided by the adoption of neutral monism.

In the third part, "The Structure of the Physical World," Mr. Russell undertakes to build the complex structures of physics from more elementary events. I propose especially to comment upon the construction of space-time points from events by the method of extensive abstraction. Mr. Whitehead uses the relation of extension between events. Mr. Russell rejects this on the ground that it requires events that diminish without limit, whereas there may be a finite minimum of events. Mr. Russell employs a method which is exemplified for space by the construction of a point by a set of partially overlapping spheres. In my opinion the method of extensive abstraction does not enable the realization of the program of constructing the entities of mathematical physics from the "raw material of the physical world." Consider, for example, the construction of a point by means of partially overlapping spheres. Perception does not allow one to infer the existence of spheres which possess the definiteness necessary for the construction of definite

points. Mr. Russell rejects the assumption of points as simple entities on the ground, "What is logically convenient is likely to be artificial." But the sphere which can be used to construct a point is equally artificial. The space-time theories of Mr. Whitehead and Mr. Russell are interesting and valuable logical exercises, but they are inadequate for a discussion of the empirical origin of the concepts of physics. By the method of extensive abstraction one merely builds ideal entities from other ideal entities which are definite representations of the indefinite "raw material of the physical world."

The Analysis of Matter is partly a philosophical commentary upon Sommerfeld's *Atombau* and Eddington's *Mathematical Theory of Relativity*. It is to be hoped that Mr. Russell will give us a commentary upon Weyl's *Gruppentheorie and Quantenmechanik*, in which the new quantum theory has been given its most elegant exposition.

Philosophy is a systematic theory of knowledge. Mr. Russell uses behaviorism as a basis as far as possible, but the analysis of the perceptual basis of physics leads him to the supplementary employment of the method of introspection. Mr. Russell's discussion reminds me of Professor R. B. Perry's contributions to a behavioristic theory of knowledge of some fifteen years ago.

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Social Psychology: The Psychology of Political Domination. CARL MURCHISON. Worcester: The Clark University Press. 1929. Pp. x + 210.

This small book is a hurried sketch of poorly digested reflections on social life. In the preface the author arouses hope that he has some ideas that will revitalize social psychology, but the reading of the book suggests rather, to borrow an expression of the author's, that he is calling the coroner. Luckily, however, for social psychology the fate of no science depends on every ill-fated adventure of all would-be physicians.

The thesis of the author is that "social psychology deals with those human characteristics that make political life inevitable" (3). The reason for thus limiting social psychology to political life is indicated in the preface: "Social institutions and particular forms of social behavior are but trivial and incidental consequences brought about by the ever present and irresistible influence of those persons or communities that dominate others" (VII). His general procedure is to isolate various social behavior-patterns and to indicate the various forms of each, and to suggest that the important task of the social psychologist is to discover the causes of the changes in form and of the different degrees of success achieved by individuals.

This is sketched in Parts I and II. In Part III there is a brief examination and rejection of a number of theories of political life. In Part IV the author rejects such hypotheses of social psychology as social forces, instinct, and the reality of groups. Even the reality of the individual is questioned, though he uses that concept frequently. In Part V there is a renewal of the criticism of instinct and of the concept of drive. In this part there is also a chapter devoted to showing that there will always be conservatives, or those in power, and radicals, or those seeking power. The last chapter maintains that social cohesion is merely an idea, and that social disintegration is only an appearance due to our limited view of history.

A general criticism of the book is that it suggests much and develops nothing. Propositions which should be supported and elaborated are presented *ex cathedra*. False and misleading arguments occur frequently. Great ingenuity is shown in pointing out how dissimilars are similar (pp. 13–35), and how things which are ordinarily regarded as similars are held together only by the device of a common word (pp. 175–190). The extreme nominalism of the author is frequently apparent.

I wish to give two examples of the lack of penetration or understanding of the author. In trying to minimize the differences between free and slave labor he suggests that one of the great stigmas of slavery, namely, the forcible breaking up of families, will appear less heinous to us as the divorce rate increases (p. 15). The great difference between husband and wife being torn apart, even though devoted to each other, and society sanctioning the efforts of men and women to find happiness in love even at the cost of a divorce, does not occur to him. Yet it should be clear that the more value we attach to the rights of individuals to seek love and happiness in marriage the more heinous will appear the forcible separation of families.

My second example deals with the singular inability of the author to grasp the idea of growth and complication of motive and interest. This is frequently encountered in his treatment of institutions, but one of the most glaring examples of it is found in the following observation about children: "Children play for their own amusement and have not yet learned that a financial return depends entirely upon the extent to which they behave for the benefit or amusement of others. This bit of worldly experience is probably the most essential difference between the behavior of adults and children" (p. 188).

As examples of his logic the following will serve: (1) Speaking of blood revenge, war, balance of power, and the League of Nations,

he says, "all are equally the tools of the capable and strong, and all are equally destructive of the weak and incompetent" (p. 28). Then on page 30 he shows that blood revenge makes the survival of the weak very precarious, but on page 32 he shows that war alliances and on page 35 that the League of Nations not only insure the survival of the weak, but enable them to sit in the councils of the mighty. (2) Freedom of speech is of no value because we can not be sure that what we say is true (63–67). (3) Nations do not possess group existence because Russia as a nation has disappeared (p. 168). (4) Just as a mathematician is uninfluenced in his walking by the knowledge that the shortest distance between two points is a straight line, so a man is uninfluenced in his behavior by his admissions as to what he should do (pp. 110–112). (5) "Of course, it is obvious that public opinion and anarchy can not coexist since public opinion coerces the individual (p. 119).

However defective his logic of argumentation, his logic of scientific method is equally so. This is made evident in his discussion of recent efforts to measure the strength of different drives (pp. 190–196). In that discussion he shows no appreciation of the rôle of hypotheses and of the rightful place of definition in all measurement. Of course the fact that we can note certain differences in behavior and relate them to certain quantitative changes does not demonstrate that we are correct in our theory as to what we are measuring. But when our theories are based upon a careful investigation of the observed facts and meet the various requirements of a good hypothesis, then the fact that they help to make clear the observed quantitative relations is a step toward their verification.

The hostile attitude of the author toward efforts to measure human drives is somewhat unintelligible, for in a number of instances he refers to the measurable characteristics of man. It would have been illuminating if he had given a list of these, and had shown in what respects the traits accepted by him are superior to those rejected.

There are few references and no bibliography. The fact that the author has been uninfluenced by two important developments in present-day thinking, namely, the shift from mechanical to organismic concepts, and the general acceptance of some theory of emergence with its emphasis on the reality of different levels of being, at least suggests that he has neglected recent aspects of his subject. Perhaps, however, his immunity to these developments is due to his desire to appear realistic and tough-minded, and in this he admirably succeeds.

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Heuer, Wilhelm: Warum fragen die Menschen Warum? Erkenntnistheoretische Beiträge zur Lösung des Kausalitätsproblems. Zweite, völlig neu bearbeitete Auflage. Heidelberg: Carl Winter's Universitätsbuchhandlung. 1929. xi + 321 pp. 7 M.

Moreau-Rendu, S.: L'Idée de Bonté Naturelle chez J. J. Rousseau. (Bibliothèque de Philosophie. XIII.) Paris: Marcel Rivière. 1929. 337 pp. 30 frcs.

NOTES AND NEWS

A national celebration of the seventieth birthday of John Dewey took place on October 18 and 19 in New York City. On Friday evening a meeting was held in the Horace Mann School, celebrating Dewey's educational achievements. State Commissioner F. P. Graves was chairman of the meeting. Papers were read by Professor Ernest C. Moore, of the University of California, at Los Angeles, on "John Dewey's Contribution to the Educational Theory"; Professor Jesse H. Newland, director of the Lincoln Experimental School, on "John Dewey's Influence in the Schools"; and Professor I. L. Kandel, of the Institute of International Education at Teachers College, on "John Dewey's Influence on Education in Foreign Lands."

A similar meeting on Saturday morning was devoted to Dewey's philosophy. Professor Ralph Barton Perry, of Harvard University, presided. Professor George H. Mead, of the University of Chicago, spoke on "John Dewey and the Philosophy of his Contemporaries," and Professor H. W. Schneider, of Columbia University, on "The Prospect for Empirical Philosophy." This meeting was followed by a luncheon at the Hotel Astor, attended by about 2500 persons. Miss Jane Addams spoke on "John Dewey and Social Welfare," and James Harvey Robinson on "John Dewey and Liberal Thought." At the close, Professor Dewey responded with a brief address.

The addresses will be published. Communications may be sent to the Secretary of the Committee, Henry R. Linville, President of the Teachers' Union, 70 Fifth Avenue, New York City. Honors were presented to Dewey by the National Education Association and by the Teachers' Union. Colleagues and former colleagues of Professor Dewey presented him with a volume of essays in his honor, published by Henry Holt & Co. The Columbia University Press is publishing a bibliography of Dewey's writings, compiled by Milton H. Thomas and H. W. Schneider.

The Creighton Club, which is an association of teachers of phi-

losophy connected with eleven of the universities and colleges in upper New York State, held its fall meetings at Union College, Schenectady, on November 1 and 2. The following papers were read: "The Fallacy of Impersonalism in the Interpretation of Reality," by Professor John Baillie, of the University of Toronto; "Knowledge Occurs," by Professor Richard Robinson, of Cornell University; "Current Views of Matter," by Dr. Irving Langmuir, Assistant Director of the Research Laboratory of the General Electric Company and President of the American Chemical Society.

We print below the preliminary announcement of the twenty-ninth annual meeting of the American Philosophical Association:

A Joint Meeting of the Western and Eastern Divisions will be held at Columbia University, New York City, Monday and Tuesday, December 30th and 31st.

There will be four sessions. One of them is to be on the subject: The Philosophy of John Dewey. Another session is to take the form of Concurrent Discussions, in three groups, on the following subjects: (1) The Doctrine of Essences; (2) Value as Any Object of Any Interest; (3) The Significance for Philosophy of Recent Theories of Physics. Two sessions will be devoted to papers on topics which the various members themselves offer. All members are herewith invited to contribute papers on the Philosophy of Dewey and on any of the subjects for the Concurrent Discussions.

Any member who wishes to make a contribution is requested to send to the Secretary, before November 25th, a brief abstract, of about two hundred words, of his proposed paper. The length of all papers is to be twenty minutes of reading time.

An announcement to be issued later will give further details as to time, place and program of the meeting.

C. W. HENDEL, *Acting Secretary,*

DEPARTMENT OF PHILOSOPHY,
McGILL UNIVERSITY, MONTREAL

Dr. Maurice Picard, formerly Assistant Professor of Philosophy in Lehigh University, is now Professor of Philosophy at Dartmouth College.

Directory of American Psychological Periodicals

American Journal of Psychology.—Ithaca, N. Y.; Cornell University.
Subscription $6.50. 624 pages annually. Edited by E. B. Titchener.
Quarterly. General and experimental psychology. Founded 1887.

Pedagogical Seminary and Journal of Genetic Psychology.—Worcester, Mass.; Clark University Press.
Subscription $7.00. 700 pages annually. Edited by Carl Murchison and international co-operating board. [1891.
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Bi-monthly. General. Founded 1894. Edited by Howard C. Warren.

Psychological Bulletin.—Princeton, N. J.; Psychological Review Company.
Subscription $6.00. 720 pages annually. Psychological literature.
Monthly. Founded 1904. Edited by Samuel W. Fernberger.

Psychological Monographs.—Princeton, N. J.; Psychological Review Company.
Subscription $6.00 per volume. 500 pages. Founded 1895. Edited by Raymond Dodge.
Published without fixed dates, each issue one or more researches.

Psychological Index.—Princeton, N. J.; Psychological Review Company.
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An annual bibliography of psychological literature.

Archives of Psychology.—Columbia University Post Office, New York.
Subscription $6.00. 500 pages per volume. Founded 1906. Edited by R. S. Woodworth.
Published without fixed dates, each number a single experimental study.

Journal of Abnormal Psychology and Social Psychology.—Albany, N. Y.
Subscription $5.00. Boyd Printing and Publishing Co. Edited by Morton Prince and Henry T. Moore.
Quarterly. 432 pages annually. Founded 1906. Abnormal and social.

Psychological Clinic.—Philadelphia; Psychological Clinic Press. [1907.
Subscription $2.50. 288 pages. Edited by Lightner Witmer. Founded
Without fixed dates (9 numbers). Orthogenics, psychology, hygiene.

Comparative Psychology Monographs.—Baltimore; Williams & Wilkins Co.
Subscription $5.00. 500 pages per volume. Edited by W. S. Hunter.
Published without fixed dates, each number a single research.

Psychoanalytic Review.—Washington, D. C.; 3617 Tenth Street, N. W.
Subscription $6.00. 500 pages annually. Psychoanalysis.
Quarterly. Founded 1913. Edited by W. A. White and S. E. Jelliffe.

Journal of Experimental Psychology.—Princeton, N. J.
Psychological Review Company. 500 pages annually. Experimental.
Subscription $6.00. Founded 1916. Bi-monthly. Edited by Madison Bentley.

Journal of Comparative Psychology.—Baltimore; Williams & Wilkins Co.
Subscription $5.00. 500 pages annually. Founded 1921.
Bi-monthly. Edited by Knight Dunlap and Robert M. Yerkes.

Psychological Abstracts.—Princeton, N. J.
Subscription $6.00. 600 pages annually. Edited by W. S. Hunter.
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Journal of General Psychology.—Worcester, Mass.: Clark University Press.
Subscription $7.00. 600–700 pages annually. Edited by Carl Murchison and an international coöperating board. Quarterly. Experimental, theoretical, clinical, and historical psychology. Founded 1927.

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